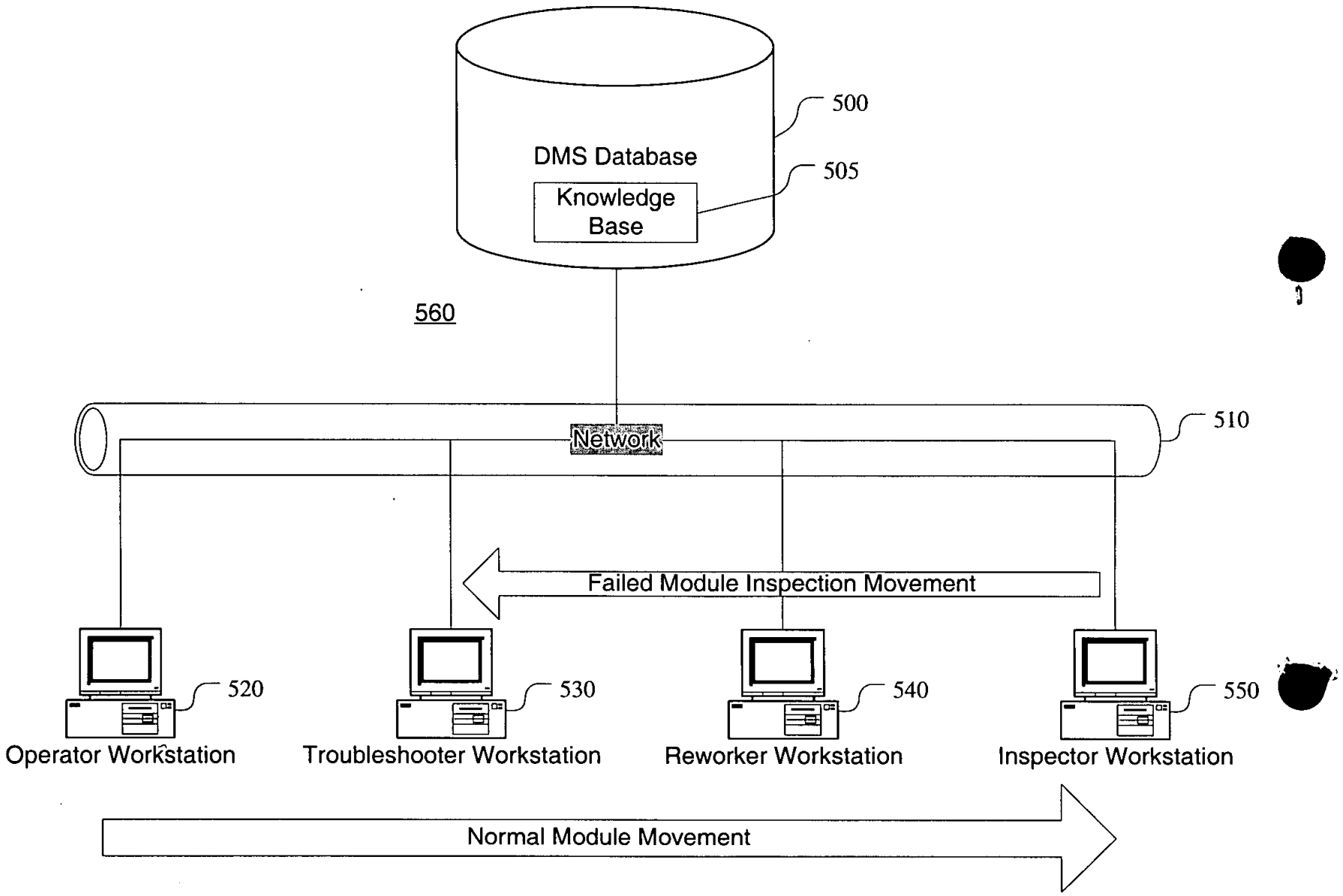
500
DMS Database
505
Knowledge Base
560
510
Network
Failed Module Inspection Movement
520
530
540
550
Operator Workstation
Troubleshooter Workstation
Reworker Workstation
Inspector Workstation
Normal Module Movement

Figure 1

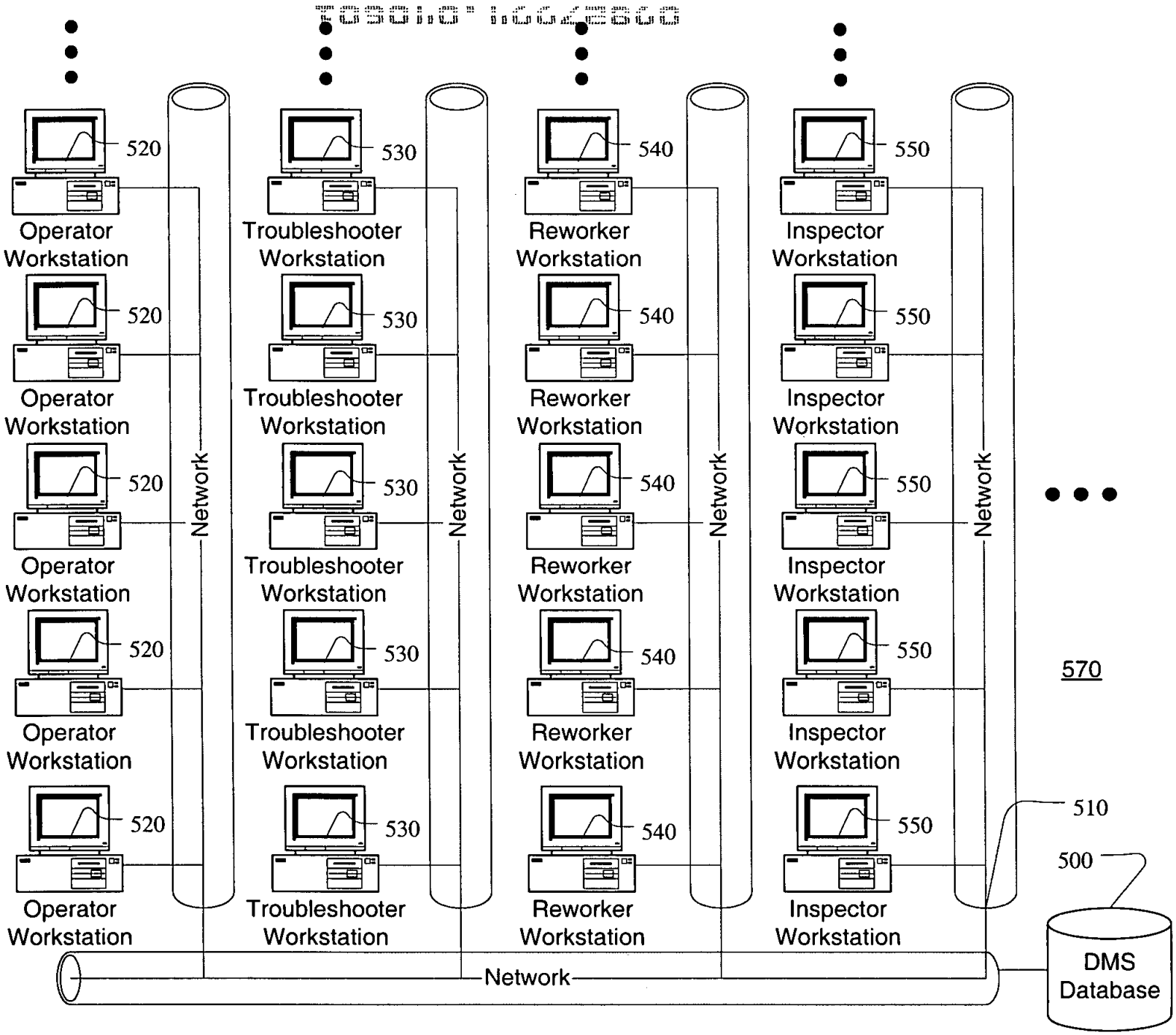
520
Operator Workstation
530
Troubleshooter Workstation
540
Reworker Workstation
550
Inspector Workstation
Network
570
510
500
DMS Database

Figure 2

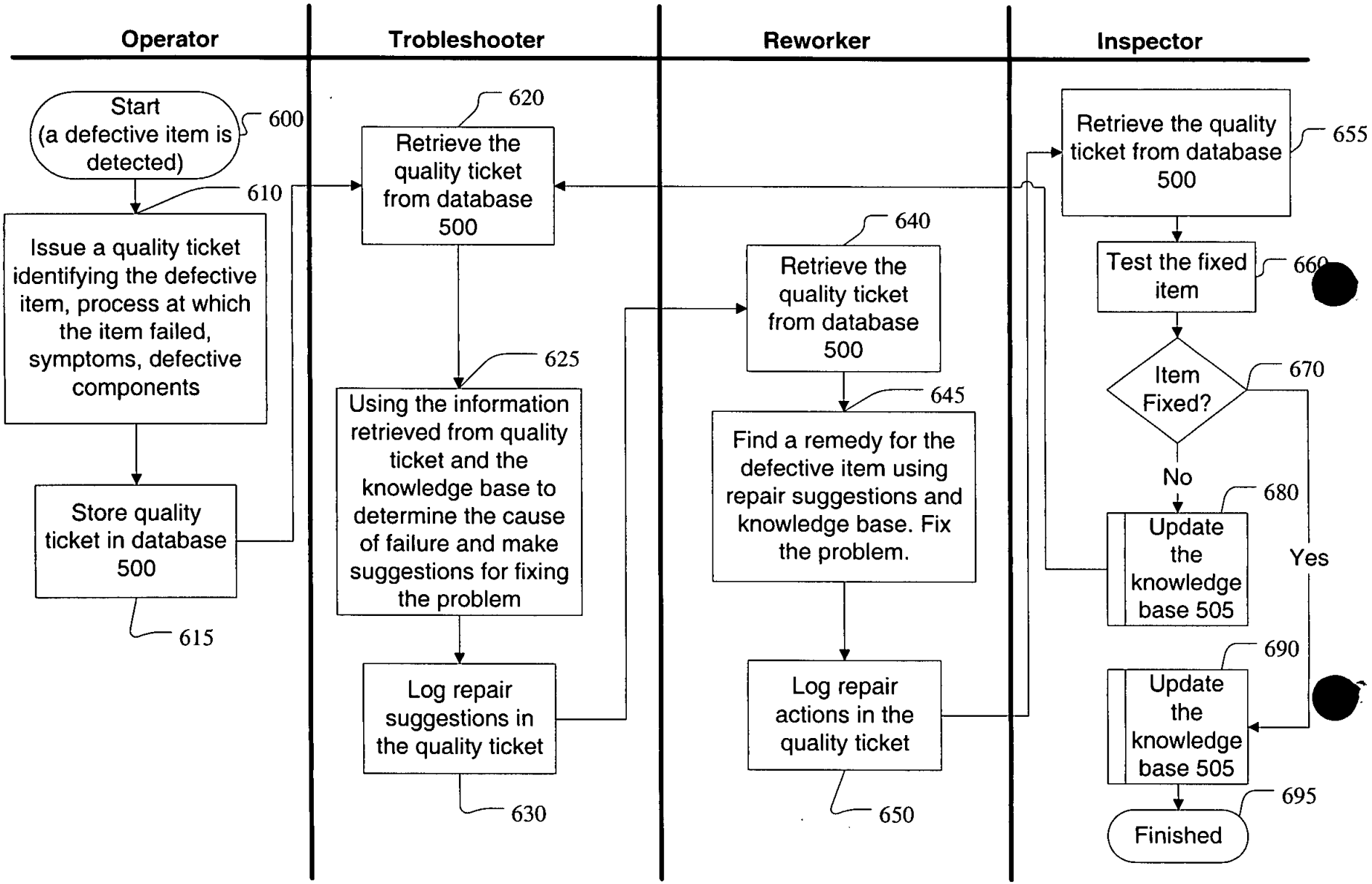
Operator
Trobleshooter
Reworker
Inspector
Start (a defective item is detected)
600
Issue a quality ticket identifying the defective item, process at which the item failed, symptoms, defective components
610
Store quality ticket in database 500
615
Retrieve the quality ticket from database 500
620
Using the information retrieved from quality ticket and the knowledge base to determine the cause of failure and make suggestions for fixing the problem
625
Log repair suggestions in the quality ticket
630
Retrieve the quality ticket from database 500
640
Find a remedy for the defective item using repair suggestions and knowledge base. Fix the problem.
645
Log repair actions in the quality ticket
650
Retrieve the quality ticket from database 500
655
Test the fixed item
660
Item Fixed?
670
No
Yes
Update the knowledge base 505
680
Update the knowledge base 505
690
Finished
695

Figure 3

Patent Application

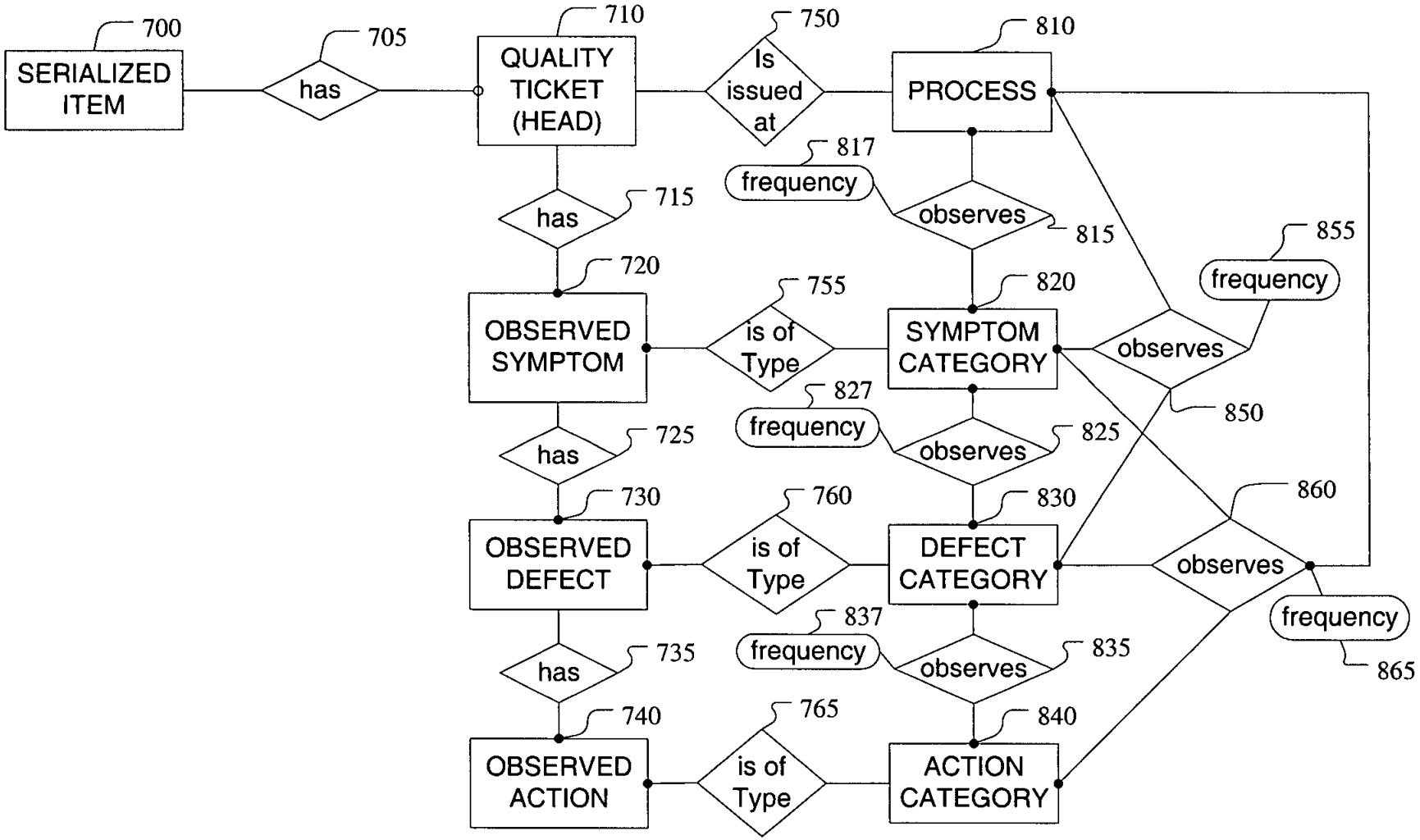

Figure 4

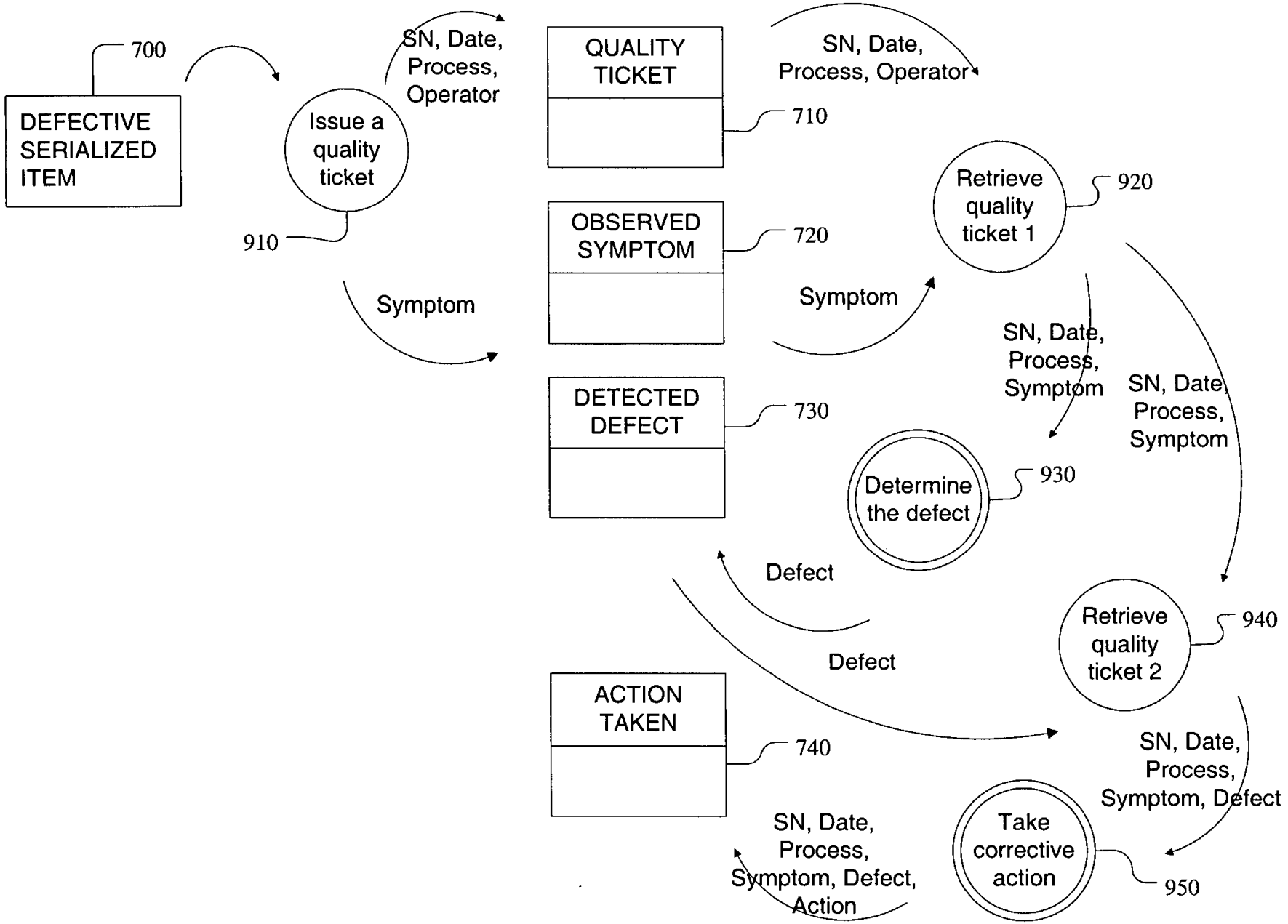
700
DEFECTIVE SERIALIZED ITEM
Issue a quality ticket
910
SN, Date, Process, Operator
QUALITY TICKET
710
SN, Date, Process, Operator
OBSERVED SYMPTOM
720
Symptom
Symptom
DETECTED DEFECT
730
Retrieve quality ticket 1
920
SN, Date, Process, Symptom
SN, Date, Process, Symptom
Determine the defect
930
Defect
Defect
Retrieve quality ticket 2
940
ACTION TAKEN
740
SN, Date, Process, Symptom, Defect
SN, Date, Process, Symptom, Defect, Action
Take corrective action
950

Figure 5

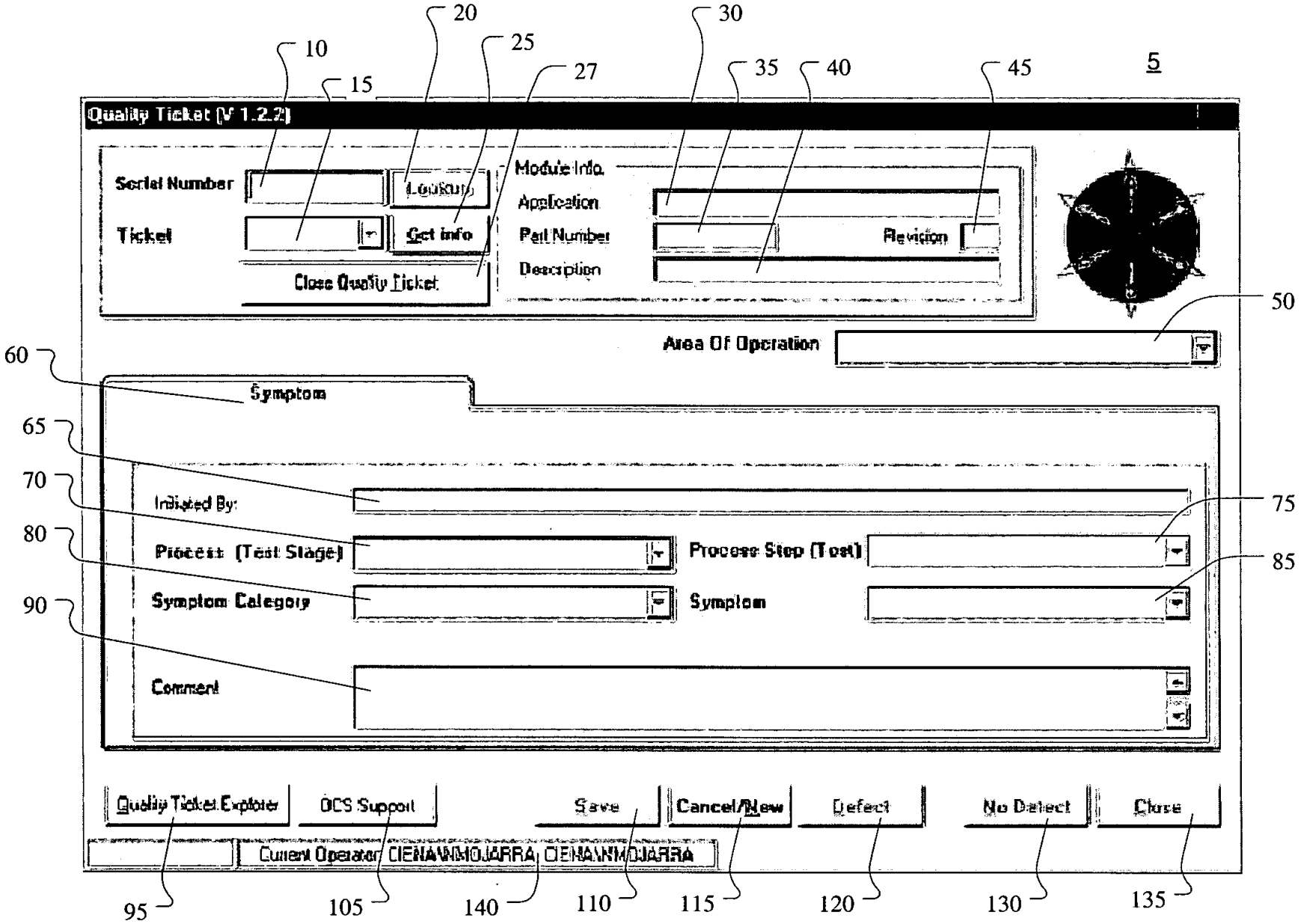
Quality Ticket (V 1.2.2)
Serial Number
Lookup
Ticket
Get Info
Close Quality Ticket
Module Info.
Application
Part Number
Revision
Description
Area Of Operation
Symptom
Initiated By:
Process (Test Stage)
Process Step (Test)
Symptom Category
Symptom
Comment
Quality Ticket Explorer
OCS Support
Save
Cancel/New
Defect
No Defect
Close
Current Operator CIENA\NMOJARRA CIENA\NMOJARRA
5
10
15
20
25
27
30
35
40
45
50
60
65
70
75
80
85
90
95
105
140
110
115
120
130
135

Figure 6a

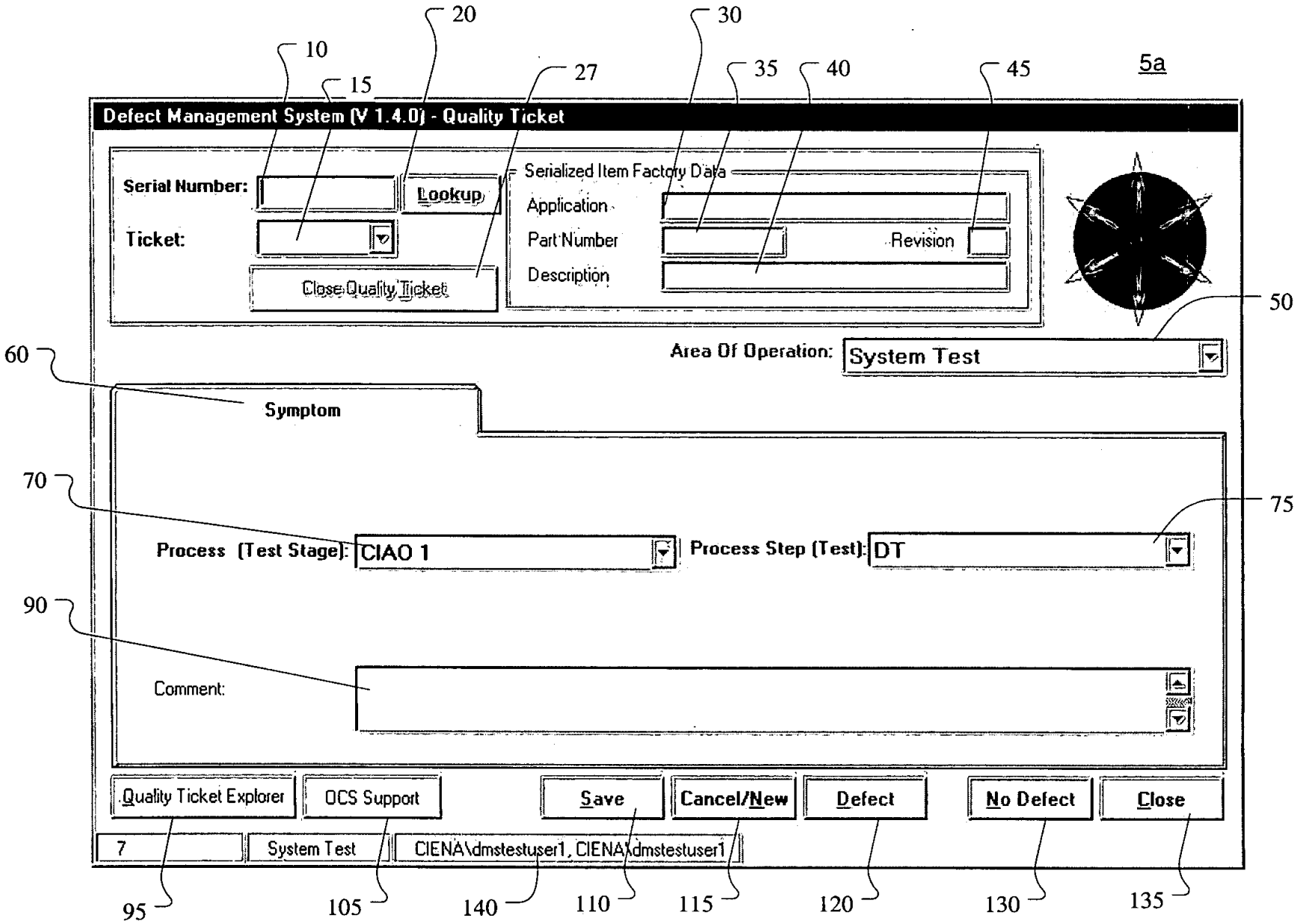
10
15
20
27
30
35
40
45
5a
Defect Management System (V 1.4.0) - Quality Ticket
Serial Number:
Lookup
Ticket:
Close Quality Ticket
Serialized Item Factory Data
Application
Part Number
Revision
Description
50
Area Of Operation:
System Test
60
Symptom
70
75
Process (Test Stage):
CIAO 1
Process Step (Test):
DT
90
Comment:
Quality Ticket Explorer
OCS Support
Save
Cancel/New
Defect
No Defect
Close
7
System Test
CIENA\dmstestuser1, CIENA\dmstestuser1
95
105
140
110
115
120
130
135

Figure 6b

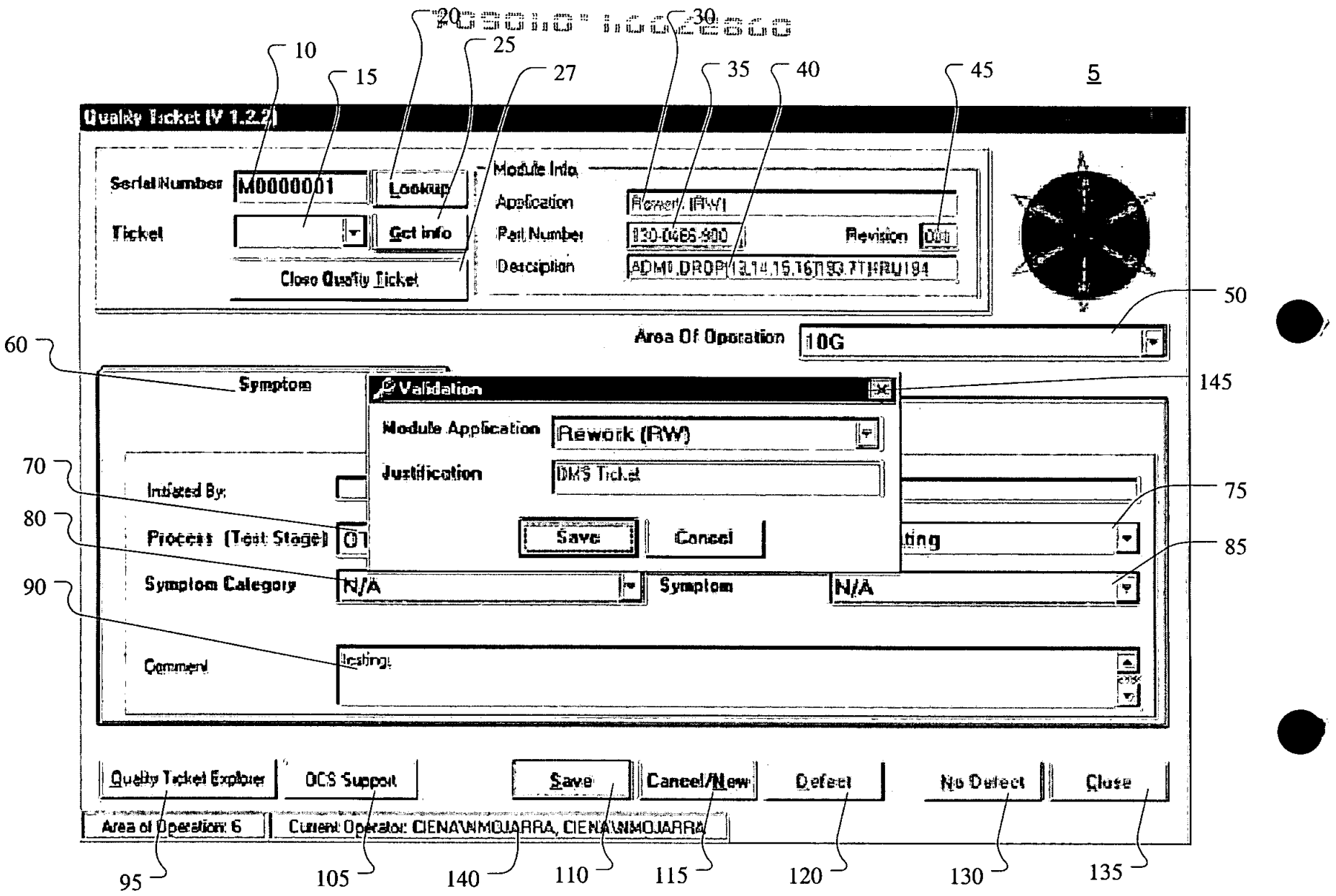
Quality Ticket (V 1.2.2)
Serial Number
M0000001
Lookup
Ticket
Get Info
Close Quality Ticket
Module Info
Application
Rework (RW)
Part Number
130-0465-800
Revision
Description
Area Of Operation
10G
Symptom
Validation
Module Application
Rework (RW)
Justification
DMS Ticket
Save
Cancel
Initiated By
Process (Test Stage)
Symptom Category
N/A
Symptom
N/A
Comment
testing
Quality Ticket Explorer
OCS Support
Save
Cancel/New
Defect
No Defect
Close
Area of Operation: 6
Current Operator: CIENA\NMOJARRA, CIENA\NMOJARRA
10
15
20
25
27
30
35
40
45
5
50
60
70
75
80
85
90
95
105
140
110
115
120
130
135
145

Figure 7

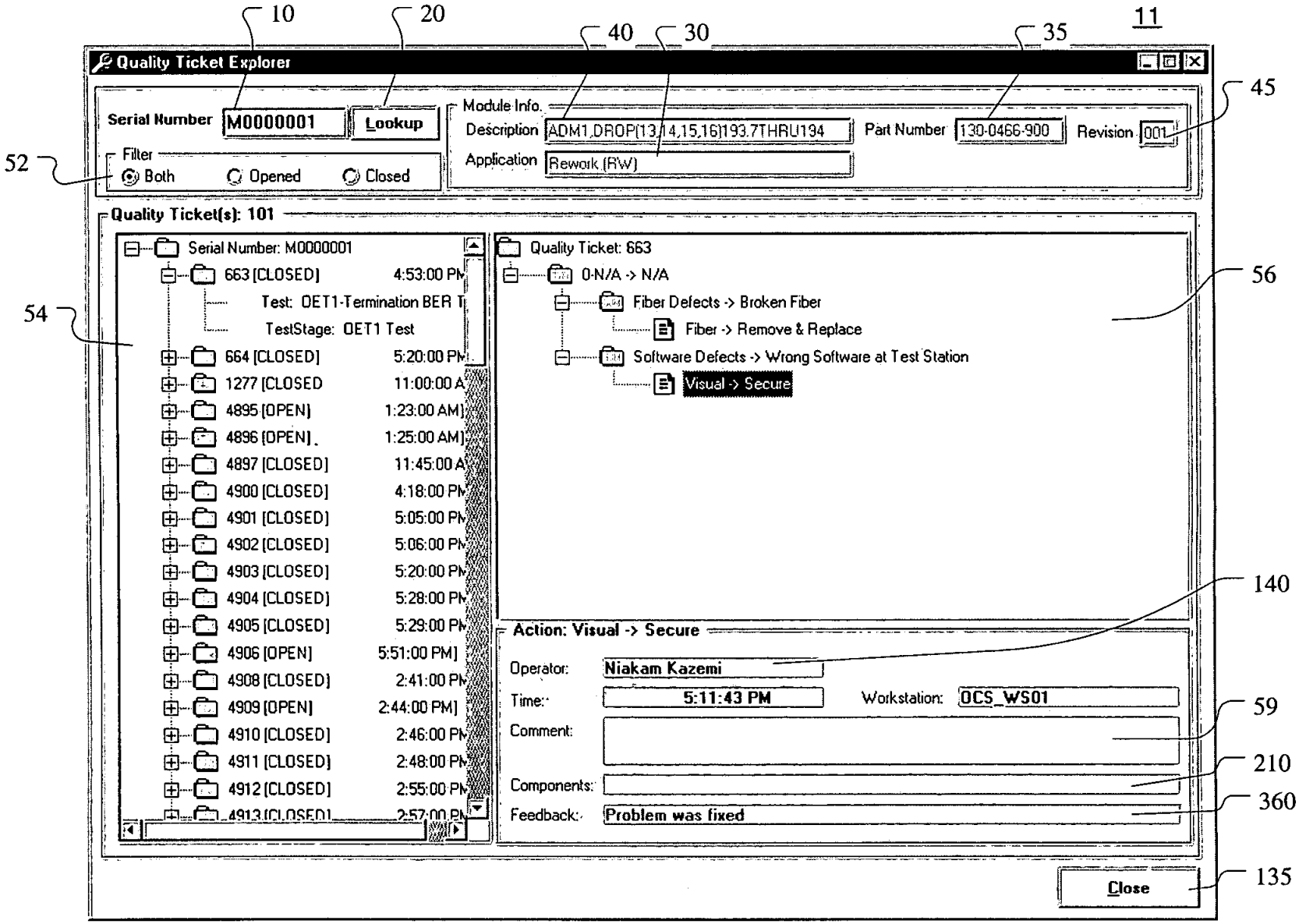
10
20
40
30
35
11
45
52
54
56
140
59
210
360
135
Quality Ticket Explorer
Serial Number
M0000001
Lookup
Module Info.
Description
ADM1,DROP(13,14,15,16)193.7THRU194
Part Number
130-0466-900
Revision
001
Application
Rework (RW)
Filter
Both
Opened
Closed
Quality Ticket(s): 101
Serial Number: M0000001
663 [CLOSED] 4:53:00 PM
Test: OET1-Termination BER T
TestStage: OET1 Test
664 [CLOSED] 5:20:00 PM
1277 [CLOSED 11:00:00 A
4895 [OPEN] 1:23:00 AM]
4896 [OPEN] 1:25:00 AM]
4897 [CLOSED] 11:45:00 A
4900 [CLOSED] 4:18:00 PM
4901 [CLOSED] 5:05:00 PM
4902 [CLOSED] 5:06:00 PM
4903 [CLOSED] 5:20:00 PM
4904 [CLOSED] 5:28:00 PM
4905 [CLOSED] 5:29:00 PM
4906 [OPEN] 5:51:00 PM]
4908 [CLOSED] 2:41:00 PM
4909 [OPEN] 2:44:00 PM]
4910 [CLOSED] 2:46:00 PM
4911 [CLOSED] 2:48:00 PM
4912 [CLOSED] 2:55:00 PM
4913 [CLOSED] 2:57:00 PM
Quality Ticket: 663
0-N/A -> N/A
Fiber Defects -> Broken Fiber
Fiber -> Remove & Replace
Software Defects -> Wrong Software at Test Station
Visual -> Secure
Action: Visual -> Secure
Operator:
Niakam Kazemi
Time:
5:11:43 PM
Workstation:
OCS_WS01
Comment:
Components:
Feedback:
Problem was fixed
Close

Figure 8

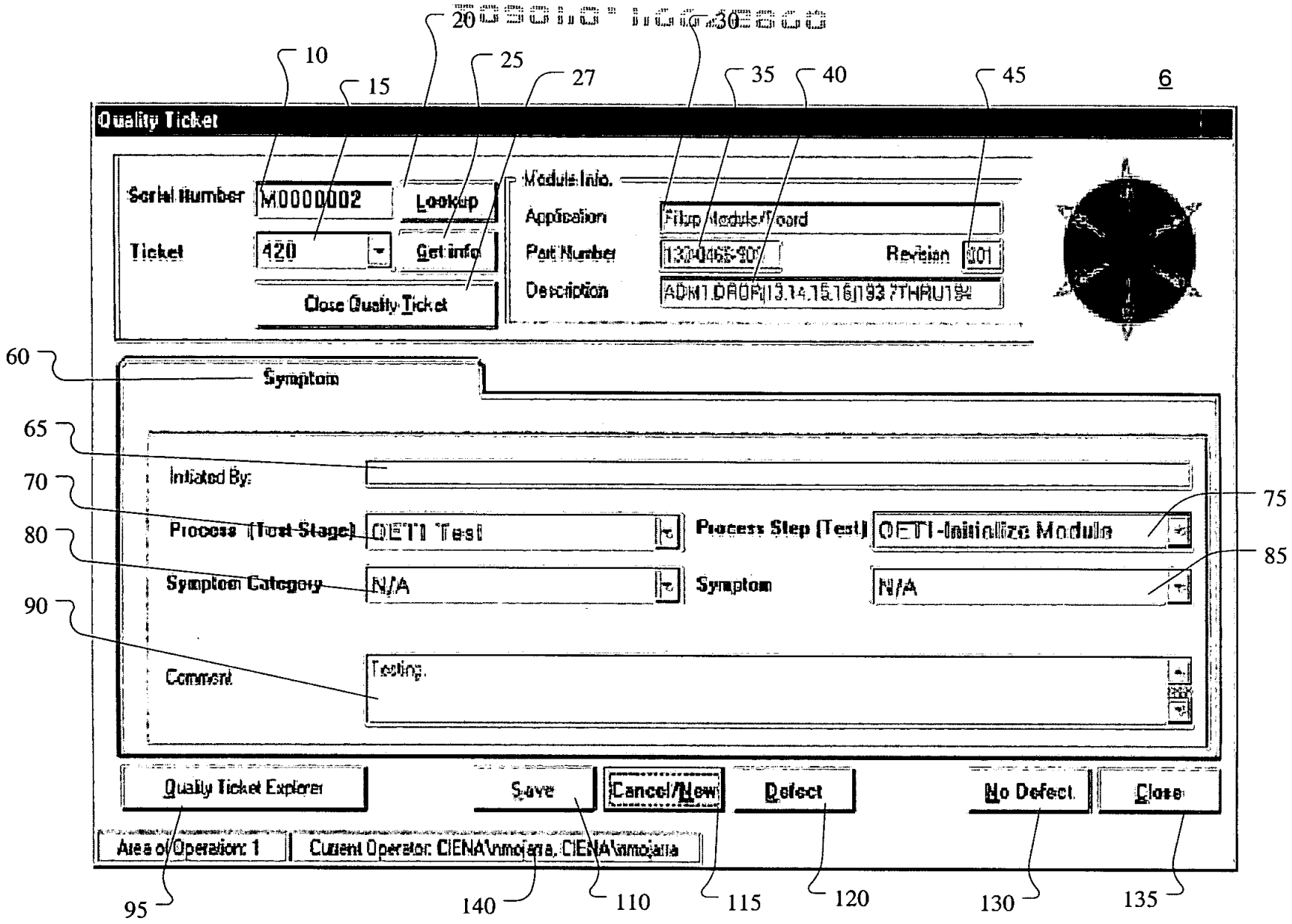
Quality Ticket
Serial Number
M0000002
Lookup
Ticket
420
Get Info
Close Quality Ticket
Module Info.
Application
Part Number
Revision
Description
Symptom
Initiated By:
Process (Test Stage)
OETI Test
Process Step (Test)
OETI-Initialize Module
Symptom Category
N/A
Symptom
N/A
Comment
Testing.
Quality Ticket Explorer
Save
Cancel/New
Defect
No Defect
Close
Area of Operation: 1
Current Operator: CIENA\mojarra, CIENA\mojarra
10
15
20
25
27
30
35
40
45
6
60
65
70
75
80
85
90
95
140
110
115
120
130
135

Figure 9

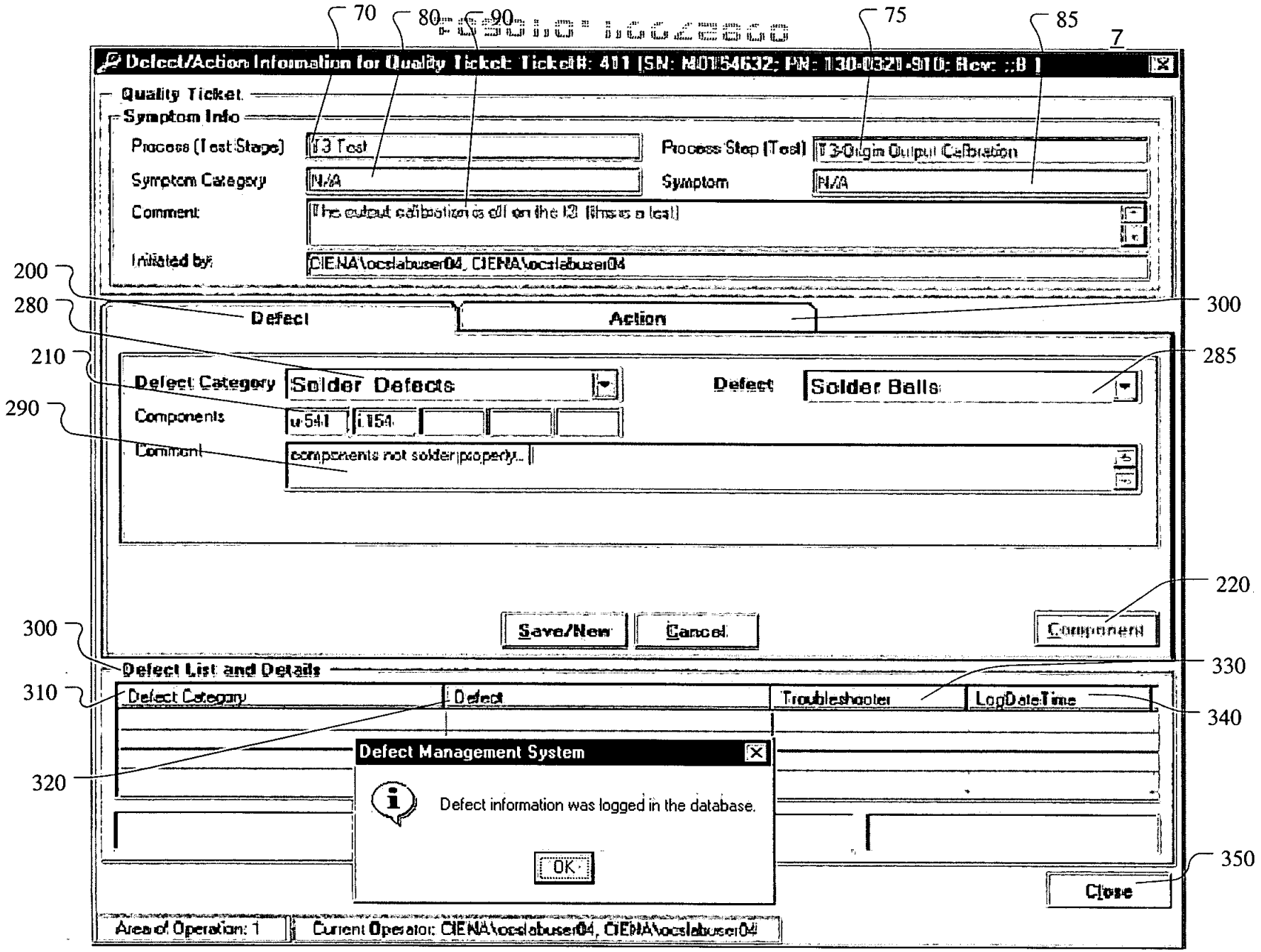
70
80
90
75
85
7
Defect/Action Information for Quality Ticket: Ticket#: 411 [SN: M0154632; PN: 130-0321-910; Rev: ::B]
Quality Ticket
Symptom Info
Process (Test Stage)
T3 Test
Process Step (Test)
T3-Origin Output Calibration
Symptom Category
N/A
Symptom
N/A
Comment:
The output calibration is off on the I2. (this is a test)
Initiated by:
CIENA\ocslabuser04, CIENA\ocslabuser04
200
280
210
290
300
285
Defect
Action
Defect Category
Solder Defects
Defect
Solder Balls
Components
u541
L154
Comment
components not solder properly..
220
Save/New
Cancel
Component
300
Defect List and Details
310
330
340
320
Defect Category
Defect
Troubleshooter
LogDateTime
Defect Management System
Defect information was logged in the database.
OK
350
Close
Area of Operation: 1
Current Operator: CIENA\ocslabuser04, CIENA\ocslabuser04

Figure 10a

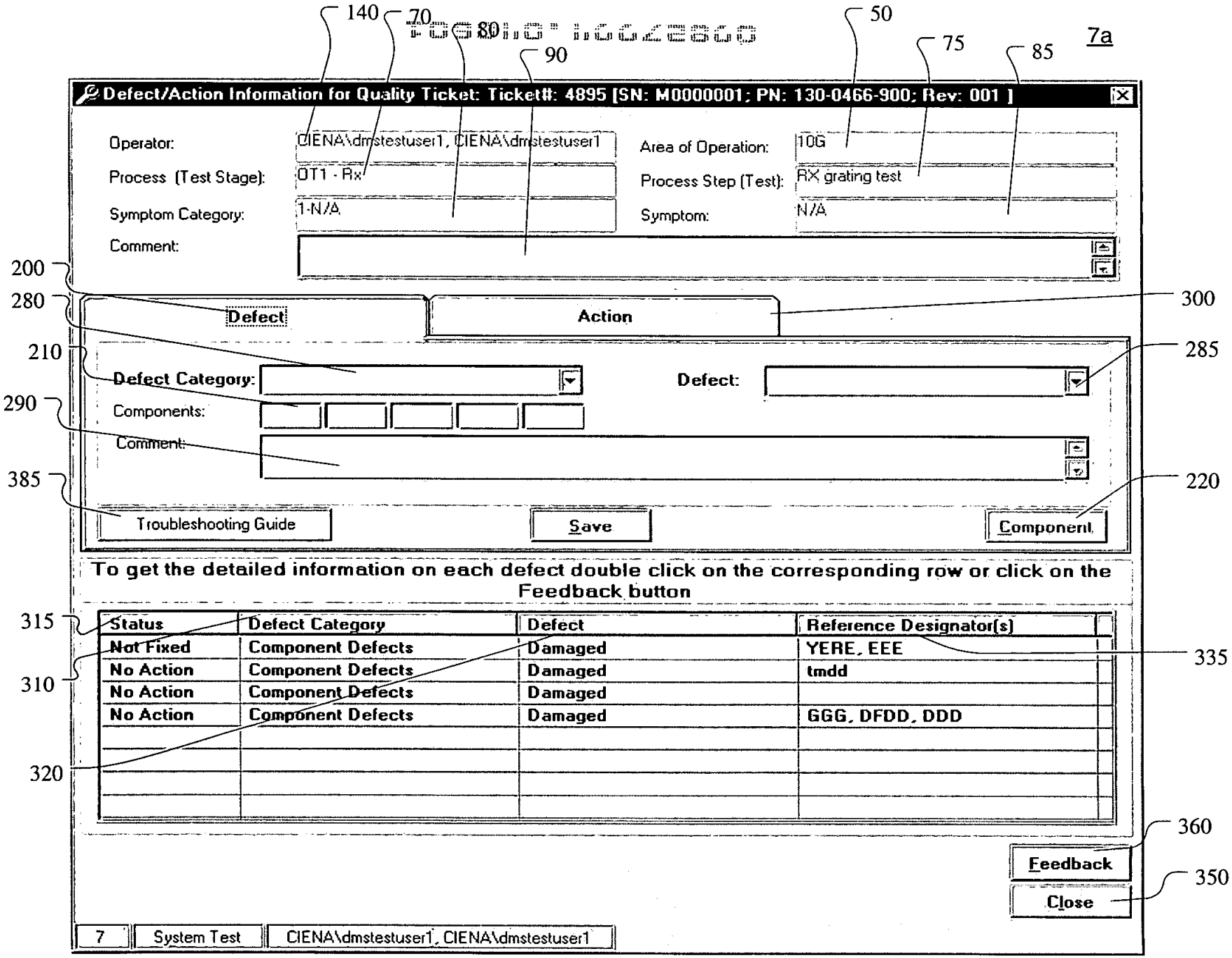
140
70
80
90
50
75
85
7a
Defect/Action Information for Quality Ticket: Ticket#: 4895 [SN: M0000001; PN: 130-0466-900; Rev: 001]
Operator:
CIENA\dmstestuser1, CIENA\dmstestuser1
Area of Operation:
10G
Process (Test Stage):
OT1 - Rx
Process Step (Test):
RX grating test
Symptom Category:
1-N/A
Symptom:
N/A
Comment:
200
280
Defect
Action
300
210
Defect Category:
Defect:
285
290
Components:
Comment:
385
220
Troubleshooting Guide
Save
Component
To get the detailed information on each defect double click on the corresponding row or click on the Feedback button
315
310
320
335
Status
Defect Category
Defect
Reference Designator(s)
Not Fixed
Component Defects
Damaged
YERE, EEE
No Action
Component Defects
Damaged
tmdd
No Action
Component Defects
Damaged
No Action
Component Defects
Damaged
GGG, DFDD, DDD
360
Feedback
350
Close
7
System Test
CIENA\dmstestuser1, CIENA\dmstestuser1

Figure 10b

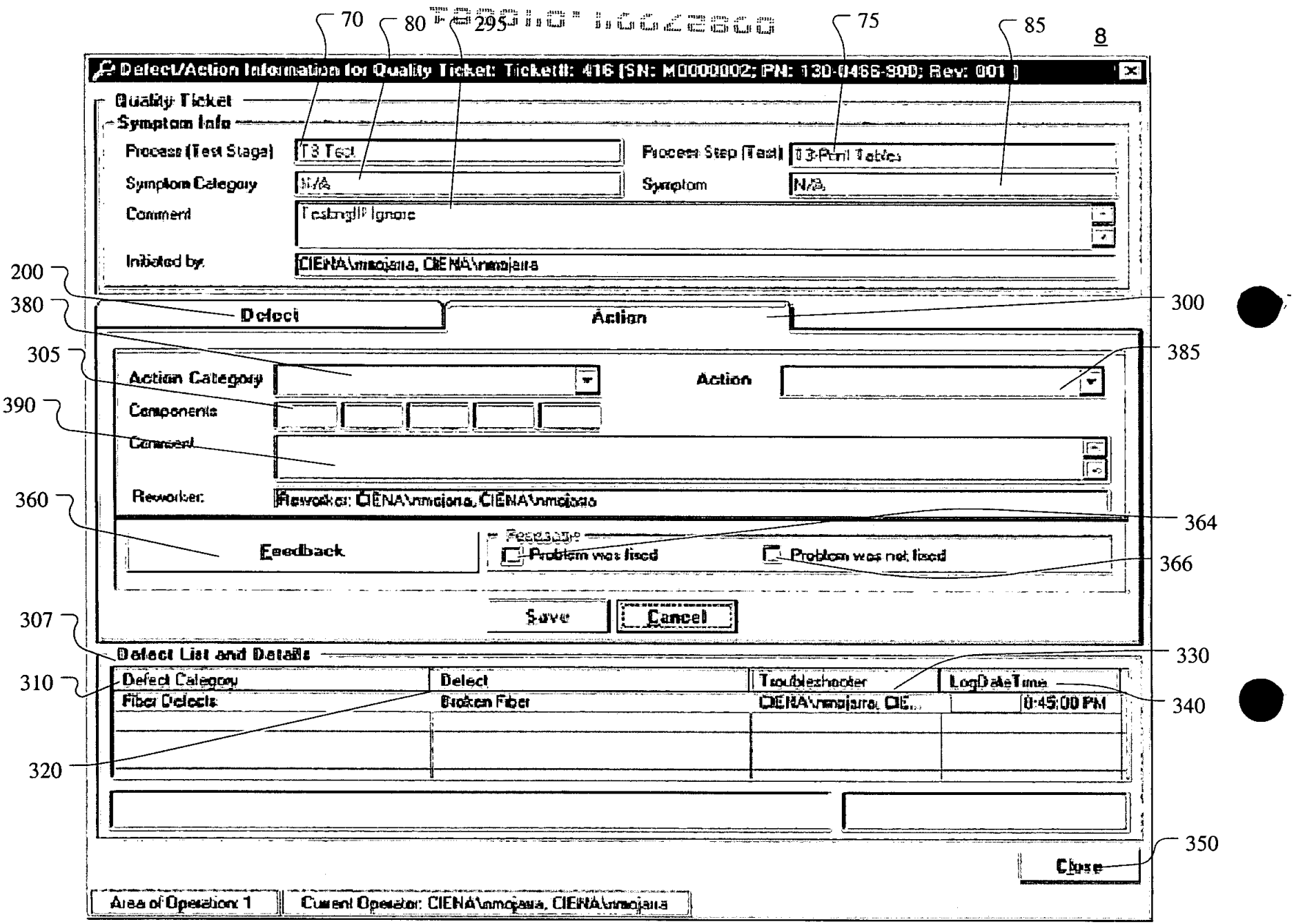
70
80
295
75
85
8
Defect/Action Information for Quality Ticket: TicketID: 416 [SN: M0000002; PN: 130-0466-900; Rev: 001]
Quality Ticket
Symptom Info
Process (Test Stage)
T3 Test
Process Step (Test)
13-Port Tables
Symptom Category
N/A
Symptom
N/A
Comment
Testing!!! Ignore
Initiated by:
CIENA\mmojarra, CIENA\mmojarra
200
380
Defect
Action
300
305
385
Action Category
Action
Components
390
Comment
Reworker:
Reworker: CIENA\mmojarra, CIENA\mmojarra
360
364
Feedback
Problem was fixed
Problem was not fixed
366
Save
Cancel
307
Defect List and Details
330
310
Defect Category
Defect
Troubleshooter
LogDateTime
Fiber Defects
Broken Fiber
CIENA\mmojarra, CIE...
0:45:00 PM
340
320
350
Close
Area of Operation: 1
Current Operator: CIENA\mmojarra, CIENA\mmojarra

Figure 11a

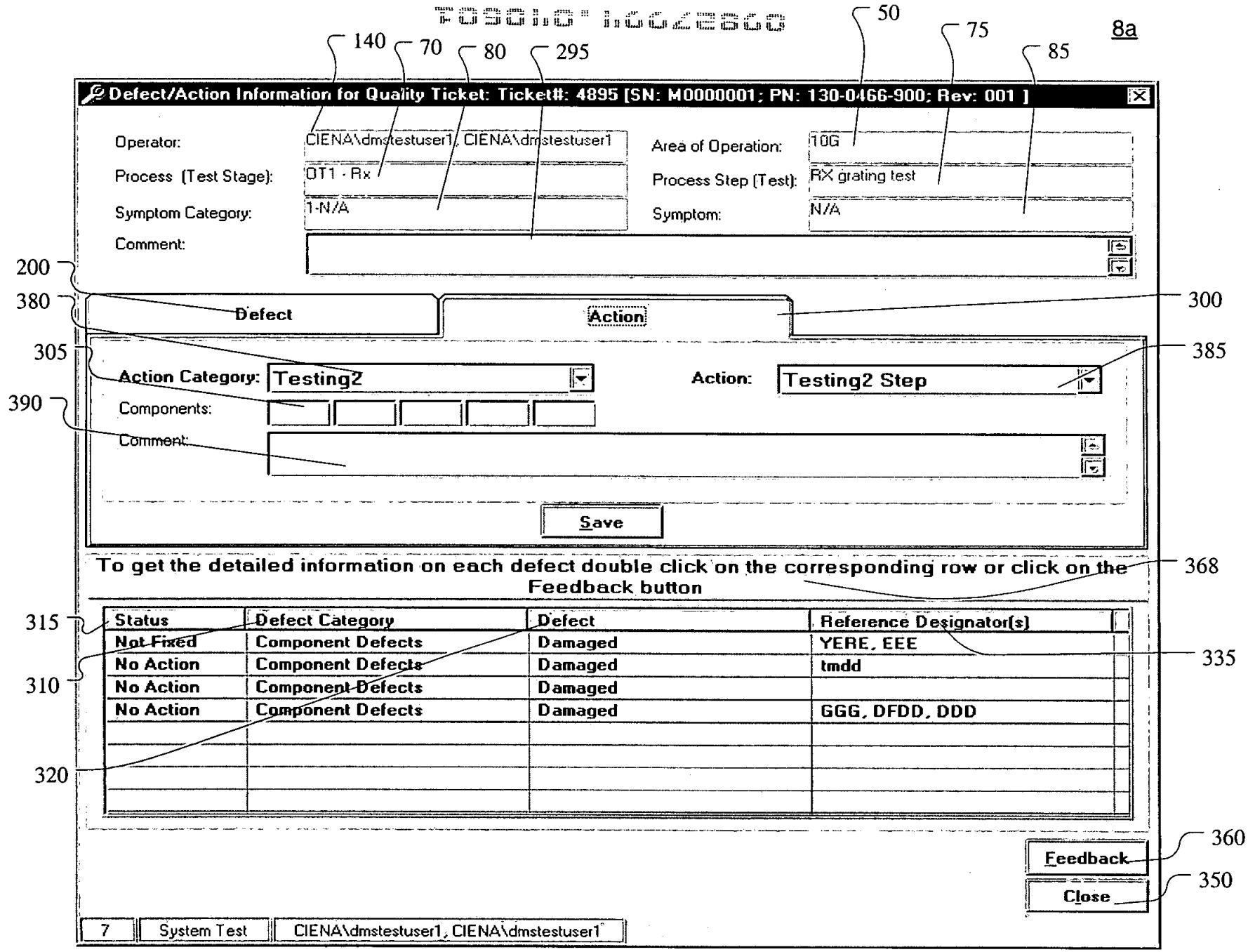
8a
Defect/Action Information for Quality Ticket: Ticket#: 4895 [SN: M0000001; PN: 130-0466-900; Rev: 001]
Operator:
CIENA\dmstestuser1, CIENA\dmstestuser1
Process (Test Stage):
OT1 - Rx
Symptom Category:
1-N/A
Comment:
Area of Operation:
10G
Process Step (Test):
RX grating test
Symptom:
N/A
Defect
Action
Action Category:
Testing2
Action:
Testing2 Step
Components:
Comment:
Save
To get the detailed information on each defect double click on the corresponding row or click on the Feedback button
Status
Defect Category
Defect
Reference Designator(s)
Not Fixed
Component Defects
Damaged
YERE, EEE
No Action
Component Defects
Damaged
tmdd
No Action
Component Defects
Damaged
No Action
Component Defects
Damaged
GGG, DFDD, DDD
Feedback
Close
7
System Test
CIENA\dmstestuser1, CIENA\dmstestuser1
140
70
80
295
50
75
85
200
380
300
305
385
390
315
310
320
368
335
360
350

Figure 11b

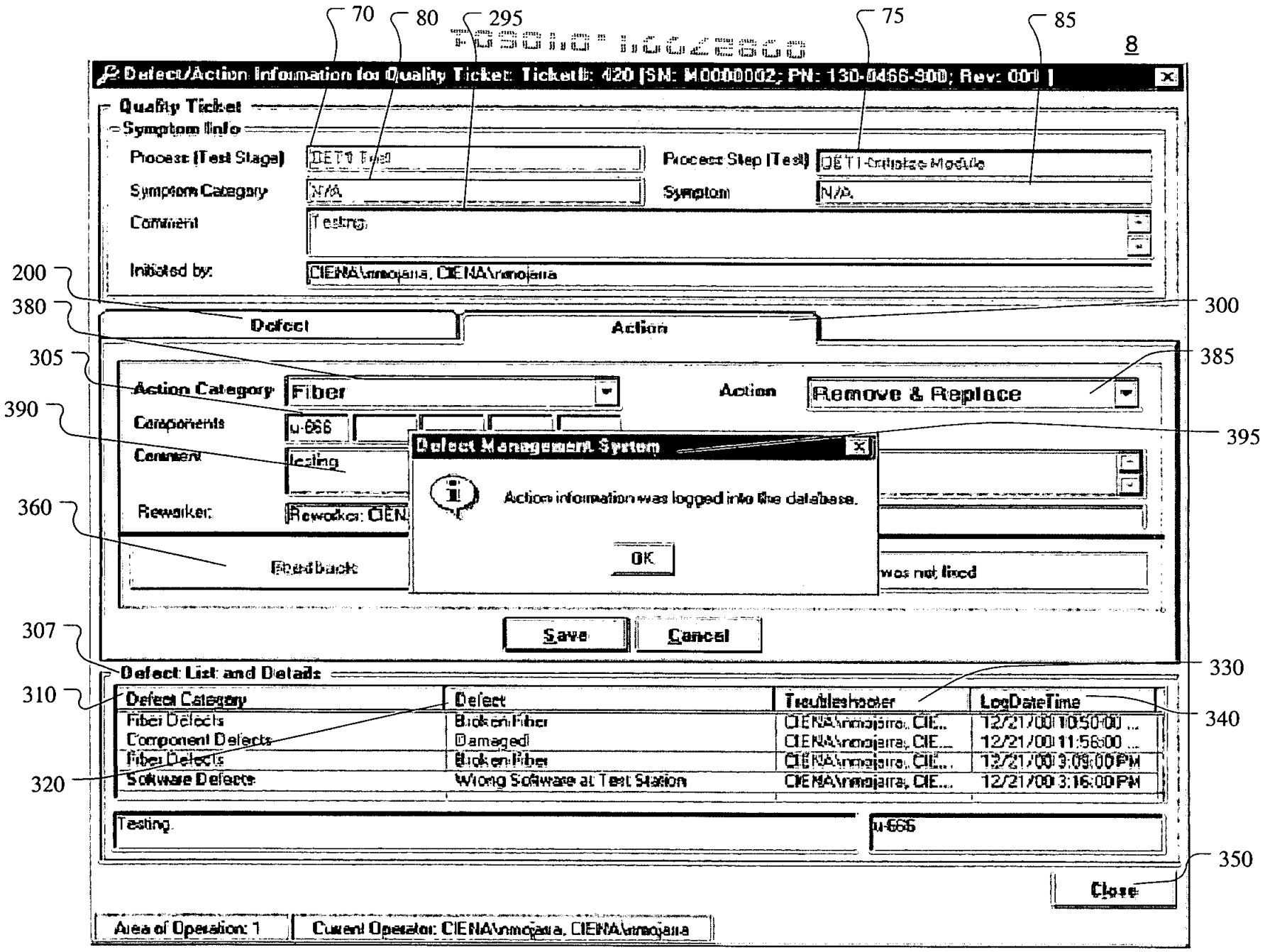
70
80
295
75
85
8
Defect/Action Information for Quality Ticket: TicketID: 420 [SN: M00000002; PN: 130-0466-900; Rev: 001]
Quality Ticket
Symptom Info
Process (Test Stage)
Process Step (Test)
Symptom Category
N/A
Symptom
N/A
Comment
Testing
Initiated by:
CIENA\mmojarra, CIENA\mmojarra
200
380
300
Defect
Action
305
385
Action Category
Fiber
Action
Remove & Replace
390
Components
u-666
Comment
Testing
395
Defect Management System
Action information was logged into the database.
OK
Rewriker:
360
Feedback
was not fixed
Save
Cancel
307
Defect List and Details
330
310
Defect Category
Defect
Troubleshooter
LogDateTime
340
Fiber Defects
Broken Fiber
CIENA\mmojarra, CIE...
12/21/00 10:50:00 ...
Component Defects
Damaged
CIENA\mmojarra, CIE...
12/21/00 11:56:00 ...
Fiber Defects
Broken Fiber
CIENA\mmojarra, CIE...
12/21/00 3:09:00 PM
320
Software Defects
Wrong Software at Test Station
CIENA\mmojarra, CIE...
12/21/00 3:16:00 PM
Testing
u-666
350
Close
Area of Operation: 1
Current Operator: CIENA\mmojarra, CIENA\mmojarra

Figure 12

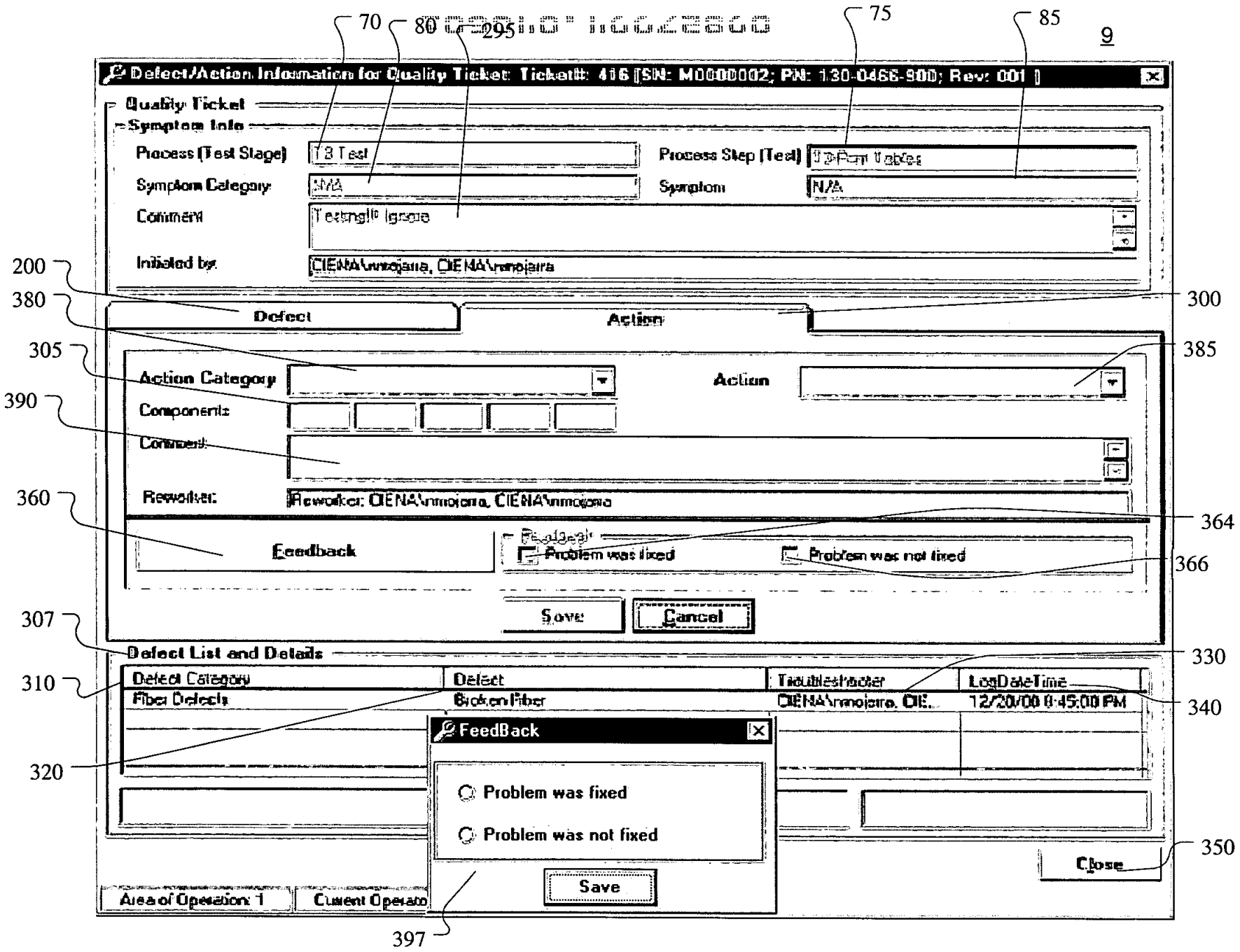
70
80
295
75
85
9
Defect/Action Information for Quality Ticket: Ticket#: 416 [SN: M0000002; PN: 130-0466-900; Rev: 001]
Quality Ticket
Symptom Info
Process (Test Stage)
T3 Test
Process Step (Test)
Symptom Category
N/A
Symptom
N/A
Comment
Initiated by:
CIENA\nmojarra, CIENA\nmojarra
200
380
300
Defect
Action
305
385
Action Category
Action
Components
390
Comment
Rewalker:
Rewalker: CIENA\nmojarra, CIENA\nmojarra
360
364
Feedback
Problem was fixed
Problem was not fixed
366
Save
Cancel
307
Defect List and Details
330
310
Defect Category
Defect
TroubleShooter
LogDateTime
Fiber Defects
Broken Fiber
CIENA\nmojarra, CIE...
12/20/00 8:45:00 PM
340
320
FeedBack
Problem was fixed
Problem was not fixed
Save
350
Close
Area of Operation: 1
Current Operato
397

Figure 13

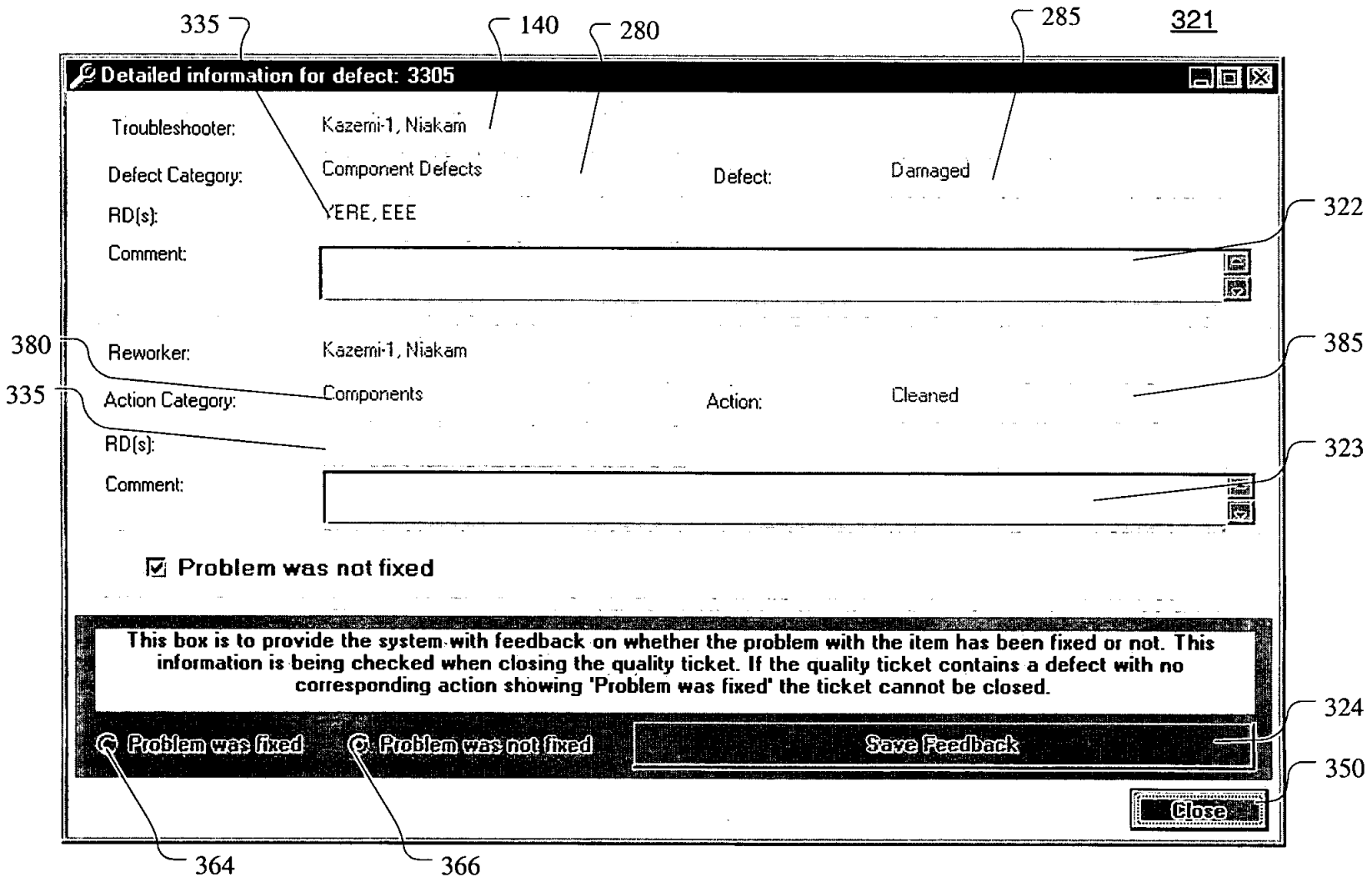
335
140
280
285
321
Detailed information for defect: 3305
Troubleshooter:
Kazemi-1, Niakam
Defect Category:
Component Defects
Defect:
Damaged
RD(s):
YERE, EEE
Comment:
322
380
Reworker:
Kazemi-1, Niakam
385
335
Action Category:
Components
Action:
Cleaned
RD(s):
Comment:
323
Problem was not fixed
This box is to provide the system with feedback on whether the problem with the item has been fixed or not. This information is being checked when closing the quality ticket. If the quality ticket contains a defect with no corresponding action showing 'Problem was fixed' the ticket cannot be closed.
Problem was fixed
Problem was not fixed
Save Feedback
324
350
Close
364
366

Figure 14

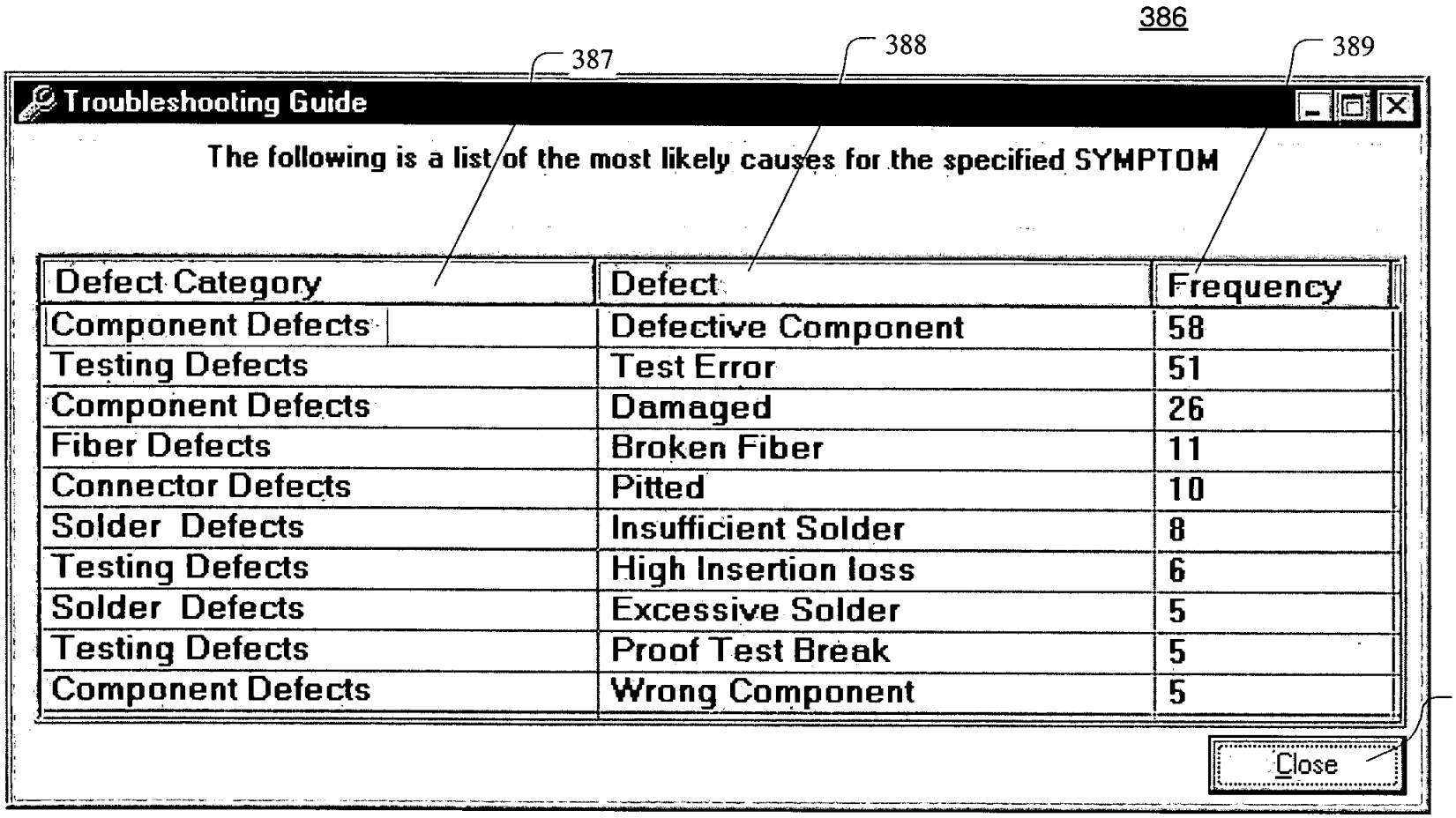
386
387
388
389
Troubleshooting Guide
The following is a list of the most likely causes for the specified SYMPTOM
Defect Category
Defect
Frequency
Component Defects
Defective Component
58
Testing Defects
Test Error
51
Component Defects
Damaged
26
Fiber Defects
Broken Fiber
11
Connector Defects
Pitted
10
Solder Defects
Insufficient Solder
8
Testing Defects
High Insertion loss
6
Solder Defects
Excessive Solder
5
Testing Defects
Proof Test Break
5
Component Defects
Wrong Component
5
350
Close

Figure 15